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ENGINEERING EVALUATION REPORT
Zantaz, Plant No. 17686
APPLICATION No. 14357

BACKGROUND

Zantaz submitted this application to obtain an Authority to Construct and/or Permit to Operate for the following sources:

S-1 Emergency Diesel Engine, Cummins, Model 1000 DQFAS, EPA/CARB Engine Family Name 6CEXL030.AAD, 1490 BHP

The facility has two halves, Building A and Building B. These halves are joined in the middle by a lobby. This entire structure shall be considered one building. The back up power from this generator will power the facility's data center. Pursuant to Regulation 2, Rule 1, Section 232 and the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines, S-1 is considered a new source.

EMISSIONS

Basis:
Annual emissions from S-1, assuming 50 hr/yr of total operation (to comply with ATCM requirements) and 1490 bhp, will be calculated using emission factors provided by Executive Order U-R-003-0335. The SO2 emission factor is from EPA AP-42, Table 3.4-1 ("Large Stationary Diesel and Dual-Fuel Engines"), which is based on full conversion of fuel sulfur to SO2 and which will therefore be considered applicable to any diesel engine (sulfur content will be assumed to be the California limit of 0.05 wt% sulfur):

SO2 = 8.09E-3(0.05) lb/hp-hr (454 g/lb) = 0.18 g/hp-hr
NMHC = 1 g/bhp-hr
NOx + NMHC = 6.2 g/kw-hr(0.742 kw/hp) = 4.6 g/bhp-hr
CO = 0.7 g/kw-hr(0.742 kw/hp) = 0.52 g/bhp-hr
PM_{10} = 0.11 g/kw-hr(0.742 kw/hp) = 0.082 g/bhp-hr

Pollutant	Emission Factor (g/bhp-hr)	Maximum Annual Emissions (Cumulative Increase)[1] (TPY)	Maximum Daily Emissions per Engine[2] (lb/day)
NO_x	4.6	0.38	362
CO	0.52	0.04	41
PM_{10}	0.082	0.01	7
POC	1.0	0.08	78
SO2	0.18	0.01	14

BACT

[1] Emissions are determined by the following calculation:
lb/yr = (50 hr/yr) (1490 bhp) (Emission Factor [=] g/bhp-hr) (1 lb/453.6 g)(1 T/2000 lb)

[2] Maximum daily emissions based on 2 hours per day. Emissions are determined by the following calculation:
lb/day = (24 hr/day) (1490 bhp) (Emission Factor [=] g/bhp-hr) (1lb/453.6 g)

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As per Regulation 2, Rule 2, Section 301, BACT is triggered for S-1, because NO_x, CO, POC, and SO2 emissions are in excess of the 10-lb/highest day trigger level for BACT. Document number 96.1.2 of the District's BACT/TBACT Workbook gives BACT guidelines for the source category of IC Engines-Compression Ignition at or above 175 hp output rating.

The BACT guidelines per this section are as follows:

POLLUTANT	BACT 1. Technologically Feasible/ Cost Effective 2. Achieved in Practice 3. TBACT	TYPICAL TECHNOLOGY
POC	1. *0.30 g/bhp-hr [62 ppmvd @ 15% O_2] a,b* 2. *1.5 g/bhp-hr [309 ppmvd @ 15% O_2] b,c*	1. *Catalytic Oxidation and CARB or EPA (or equivalent) low-total hydrocarbon emitting certified engine a,b* 2. *CARB or EPA (or equivalent) low-total hydrocarbon emitting certified engine b,c*
NOx	1. *1.5 g/bhp-hr [107 ppmvd @ 15% O_2] a,b* 2. *6.9 g/bhp-hr [490 ppmvd @ 15% O_2] a,b,c* 3. *6.9 g/bhp-hr [490 ppmvd @ 15 % O_2]*	1. *Selective Catalytic Reduction (SCR) + Timing Retard + Turbocharger w/ Intercooler a,b* 2. *Timing Retard $\leq 4^o$ + Turbocharger w/ Intercooler a,b,c* 3. *Timing Retard $\leq 4^o$ + Turbocharger w/ Intercooler*
SO_2	1. *n/d* 2. *fuel oil < 0.05% sulfur a,b*	1. *n/d* 2. *Fuel Selection a,b*
CO	1. *n/s* 2. *2.75 g/bhp-hr [319 ppmvd @ 15% O2] b,c*	1. *Catalytic Oxidation b* 2. *CARB or EPA (or equivalent) low-CO emitting certified engine b,c*
PM_{10}	1. *n/d* 2. *If practical, gas-fueled engine or electric motor. If not, "California Diesel Fuel" (fuel oil w/ < 0.05% by weight sulfur and < 20% by volume aromatic hydrocarbons) b* 3. *0.1 grams/bhp-hr*	1. *Catalyst Guard Bed a,b* 2. *Fuel Selection b,d* 3. *CARB or EPA (or equivalent) low-particulate matter emitting certified engine, or particulate*

a. CARB/CAPCOA Clearinghouse

b. BAAQMD NOTE: IC Engine BACT and TBACT is a low emitting, spark-ignited, gas-fueled engine with lean burn combustion or rich burn with non-selective catalytic reduction, or electric motor. A diesel engine will be permitted only if a gas-fueled engine, or electric motor, is not practical (e.g., a remote location without natural gas availability or electric power, or only a diesel engine will meet the portability and/or power/torque/rpm requirements of the application under review, or the engine is used exclusively for emergency use during involuntary loss of power).

c. Timing retard, etc. controls alone may be acceptable only in very limited situations for temporary sources.

BACT (1) for NOx is typically achieved using a selective catalytic reduction (SCR) system with timing retard and a turbocharger with an intercooler. Information on the capital cost of an SCR system for an engine of similar size to S-1 is sparse. However, the limited use of standby diesel engines does not warrant the application of a costly SCR system.

BACT(2) limits NO_x emissions to 6.9 g/bhp-hr. The certified data indicates that the NO_x emissions from S-1 are less than 4.6 g/bhp-hr. Therefore, S-1 meets the BACT(2) limits for NOx emissions. Similarly, for CO, POC, SO2, and PM10 the BACT2 requirements will be met. As a result, the source (S-1) meets BACT requirements.

OFFSETS

Pursuant to Regulation 2, Rule 2, Section 302, offsets are not triggered for NO_x and POC since their emissions from this facility, including S-1, are less than 10 tons per year. Moreover, offsets are not required for PM_{10} and SO_2 emissions as the facility is not a major facility as defined in Regulation 2, Rule 2, Section 303.

TOXIC RISK SCREEN ANALYSIS

Per the attached March 24, 2006 Risk Screening Assessment from the District's Toxics Evaluation Section, a risk screening analysis was performed on this application. The cancer risk is calculated based on the emission rate of diesel exhaust particulate matter. Diesel exhaust particulate matter is used as a surrogate for all toxic contaminants found in diesel exhaust. The District's Regulation 2, Rule 5 requires that the cumulative impacts from all related projects be evaluated in the risk screen. No other applications prior to this application triggered or required a toxics screening.

The generator is located 675 feet from the following school:

Thomas S. Hart Middle School
4433 Willow Road
Pleasanton, CA 94558

For 50 hours of operation per year, excluding periods when operation is required due to emergency conditions, the maximum cancer risk was calculated to be 1.63 chances in a million for resident, 0.58 chances in a million for an off-site worker, and 0.02 chances in a million for Thomas S. Hart Middle School. This level of risk is acceptable under District's Regulation 2, Rule 5.

STATEMENT OF COMPLIANCE

S-1, standby engine is subject to the Ringelmann No. 2 limitations of Regulation 6-303 (emissions opacity limitations). Per Regulation 6, Section 303, a person shall not emit for a period or periods aggregating more than three minutes in any hour, a visible emission that is as dark or darker than No. 2 on the Ringelmann Chart, or of such opacity as to obscure an observer's view to an equivalent or greater degree, nor shall said emission, as perceived by an opacity sensing device in good working order, where

such device is required by District Regulations, be equal to or greater than 40% opacity. Properly operated and maintained engines are expected to meet this requirement.

S-1 is also subject to the SO_2 limitations of Regulation 9-1-302 (ground level concentration) and 9-1-304 (0.5% by weight in fuel). Per Regulation 9, Rule 1, Section 302, a person shall not emit from any source a gas stream containing sulfur dioxide in excess of 300 ppm (dry). Additionally, per Regulation 9, Rule 1, Section 304, a person shall not burn any liquid fuel having a sulfur content in excess of 0.5% by weight. Compliance with both Regulations 9-1-302 and 9-1-304 is likely since California law mandates using diesel fuel with a 0.05% by weight sulfur.

Since the source is a emergency standby engine, S-1 is not subject to the requirements of Regulations 9-8-301, 9-8-302, and 9-8-502 per Regulation 9, Rule 8, Section 110.4.

9-8-110 **Exemptions:** The requirements of Sections 9-8-301, 302, and 502 shall not apply to the following:
110.4 Emergency standby engines.

The proposed project is subject to the monitoring and record keeping procedures described in Regulation 9-8-530. The requirements of this Regulation are included in the proposed permit conditions.

This application is considered to be ministerial under the District's CEQA guidelines (Regulation 2-1-311) and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emission factors in accordance with Permit Handbook Chapter 2.3.

Pursuant to the results of the Toxic Risk Screening Analysis and the ATCM for stationary diesel engines, S-1 is limited to 50 hours per year of operation for reliability-related activities and it meets the emission limits for new engines of 0.15 g/bhp-hr.

PSD, NSPS, and NESHAPS are not triggered.

This engine emissions data is CARB-certified and thus is not subject to source testing conditions to demonstrate compliance.

The generator is located 675 feet from the following school:

Thomas S. Hart Middle School
4433 Willow Road
Pleasanton, CA 94558

As a result, school public notice is triggered, per Regulation 2-1-412.

PERMIT CONDITIONS

APPLICATION 14024; Zantaz; CONDITIONS FOR S-1:

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COND#  22850   -------------------------------------

1.  Operating for reliability-related activities is limited
    to 50 hours per year per engine.
   [Basis: "Stationary Diesel Engine ATCM" section 93115,
   title 17, CA Code of Regulations,subsection(e)(2)(A)(3)]

2.  The owner or operator shall operate each emergency
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standby engine only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, state or Federal emission limit, or for reliability-related activities (maintenance and other testing, but excluding emission testing). Operating hours while mitigating emergency conditions or while emission testing to show compliance with District, state or Federal emission limits is not limited.
[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations,subsection(e)(2)(A)(3)]

3. The owner/operator shall operate each emergency standby engine only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine is installed, operated and properly maintained. [Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations,subsection(e)(4)(G)(1)]

4. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 60 months from the date of entry. Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.
   a. Hours of operation for reliability-related activities (maintenance and testing).
   b. Hours of operation for emission testing to show compliance with emission limits.
   c. Hours of operation (emergency).
   d. For each emergency, the nature of the emergency condition.
   e. Fuel usage for each engine(s).

   [Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(4)(I);Regulation 1-441]

RECOMMENDATION

Issue Authority to Construct to Zantaz for the following:

S-1 Emergency Diesel Engine, Cummins, Model 1000 DQFAS, EPA/CARB Engine Family Name 6CEXL030.AAD, 1490 BHP

BY: _____ _____
M.K. Carol Lee, Senior AQ Engineer Date: 4/3/06